



Triennial IFAC Conference on Manufacturing Modelling, Management and Control

IFAC MIM 2022

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June 22-24, 2022, Nantes, France (hybrid: face-to-face and online)

Invited session on

Assembly Line Balancing and Scheduling Problems

Sponsored by IFAC TC 5.2

Session code (for submissions): 59t97

Proposed by:

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Short presentation: The aim of this session is to present new approaches and methods for the design, balancing and part sequencing for *assembly* and *machining* lines. Nowadays, production systems are characterized by short product life-cycle time, high levels of automation, emergence of new manufacturing equipment and technologies, and high investment. These attributes lead to new assembly and machining line design problems and more frequent design and redesign needs, and hence to the demand for new methods and *decision-aid tools*. Applications of line balancing and part sequencing methods in reconfigurable manufacturing systems will be also discussed. We will also focus on studies that concentrate on assembly and machining line balancing and sequencing approaches for *cost* or *profit* optimization. Cost based models mainly address long-term investment or short term operating costs and revenues are integrated in the profit based ones. Main relevant cost categories are wages, material and inventory expenses, price of equipment and maintenance, set-up and idle time costs and the penalties of delays. Our scope covers single criterion and *multi-criteria optimization* approaches. We encourage also submissions on development of robust models taking into account possible variations of data as well as on decision support systems (DSS) and their integration in product life cycle management (PLM) applications.

Keywords: assembly lines, machining lines, line balancing, process planning, equipment selection, sequencing, flow shop scheduling, discrete optimisation, decision-aid systems

References:

- O. Battaïa, A. Dolgui. A taxonomy of line balancing problems and their solution approaches, *International Journal of Production Economics*, vol. 142, n° 2, 2013, p. 259–277.
- B. Rekiek, A. Dolgui, A. Delchambre, A. Bratcu. State of art of assembly lines design optimization. *Annual Reviews in Control*, 2002, vol.26, n° 2, p. 163–174.

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Deadline for submissions (please use the code, see **above**): **February 15th, 2022**

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